

## **CHAPTER 6**

### **REGULATORY REQUIREMENTS**

This chapter summarizes current and anticipated regulations that impact the City of Lincoln's wastewater treatment requirements.

#### **Current Water Quality Standards**

The State of Nebraska, in conjunction with the US EPA, established water quality classifications for all surface water in the state. Specific minimum water quality requirements have been established for each classification category to protect the water uses associated with that classification. These water quality requirements determine to a large degree the level of wastewater treatment required for surface discharges. Lincoln's two wastewater treatment facilities both discharge into segment LP2-20000 of Salt Creek. The quality of effluent allowed to be discharged from Lincoln's wastewater treatment facilities into the creek is dictated by the stream classification, seasonal flow condition, and secondary effluent standards through NPDES discharge permits issued by the NDEQ.

**State Stream Use Classifications.** In Nebraska, surface water quality is regulated under Title 117-Nebraska Surface Water Quality Standards. Title 117 establishes the public policy for Nebraska to protect and improve surface water quality for human consumption, aquatic life, industry, recreation, and other beneficial uses. The NDEQ has been delegated the responsibility of implementing this state program with oversight from Region VII of the US EPA.

The following surface water classifications have been established by the State of Nebraska:

- Aquatic Life
  - Coldwater (Class A and B)
  - Warm Water (Class A and B)
- Recreation (Class A and B)
- Water Supply
  - Public Drinking Water
  - Agricultural (Class A and B)
  - Industrial
- Aesthetics

Descriptions of the water quality standards associated with each use classification, and the specific classifications for individual water bodies or water body segments, are presented in the Title 117 regulations.

**Salt Creek Classification.** Use classifications, or beneficial uses, are assigned to all surface waters within the State of Nebraska. Assigned and existing use classifications are protected by the “Antidegradation Clause” and the narrative and numerical water quality criteria stated in Title 117. The Theresa Street and Northeast WWTFs both discharge into segment LP2-20000 of Salt Creek located in the Lower Platte River basin. The quality of all discharges into Salt Creek must be consistent with maintaining the quality of water in the creek at or above the quality levels established for the creek’s classifications.

Surface water bodies are classified as either cold water or warm water based on their ability to support different types of aquatic life. The cold water classification is the most restrictive in terms of water quality requirements. The cold and warm water classifications are then assigned a sub-classification of A or B, with A being the most restrictive. Recreation classifications are based on suitability for recreation and human contact. Class A is the primary contact designation and indicates the waters are to be suitable for recreational activities involving full body contact. The agricultural use classification designates the water’s suitability for irrigation of crops and ingestion by livestock. As with aquatic life and recreation classifications, agricultural Class A is more restrictive than Class B in terms of water quality requirements.

Segment LP2-20000 of Salt Creek (Beals Slough to Rock Creek) has been classified as follows:

- Aquatic Life, Warm Water Class A
  - Site-specific Ammonia Criteria
- Recreation, Class A (primary contact)
- Agricultural Use, Class B

## **Nebraska Discharge Permitting System**

The NDEQ is required to regulate point source discharges under the NPDES program, and NPDES permits are issued and enforced through the NDEQ. A point source is defined as “any discernible, confined, and discrete conveyance...from which pollutants are or may be discharged” (US EPA, 1983). Pollutants regulated include liquid and solid wastes of chemical, biological, or physical nature which are discharged into surface waters.

An effluent discharge permit issued under the NPDES includes two main elements: specific effluent limits for each regulated pollutant being discharged, and effluent monitoring requirements. NPDES permits are developed by the NDEQ and must be renewed every five years, unless an administrative extension is granted.

Effluent limits in Nebraska NPDES permits reflect two levels of treatment requirements. The first level, referred to as technology-based limits, is based on technological treatment capabilities and establishes the minimum degree of treatment required before discharge. The second level of treatment requirements, termed water-quality-based effluent limits, may be imposed on municipal and industrial dischargers if technology-based limits are insufficient to protect and maintain designated water uses and meet water quality criteria. Point source water-quality-based effluent limits are defined as waste load allocations (WLA) under the Total Maximum Daily Load (TMDL) program (US EPA, 1999). A TMDL defines the maximum quantity of a pollutant which can be

assimilated by a receiving water without exceeding water quality standards.

**Current Theresa Street WWTF NPDES Permit.** The City of Lincoln was issued an NPDES permit, No. NE0036820, on April 9, 1986 which identified effluent limitations, monitoring requirements, and other conditions for wastewater discharge from the Theresa Street WWTF. This permit expired on April 9, 1989. However, the NDEQ has issued the City numerous administrative extensions to the permit since that time. Currently, all requirements listed in the April 9, 1986 permit still apply. Tables 6-1 and 6-2 present the permit limits and monitoring requirements of the current NPDES permit. This permit will remain effective through administrative extensions until a new NPDES permit is issued, which is expected to occur in 2003. A copy of the permit is located in Appendix D.

**Table 6-1. NPDES Permit Limitations - Theresa Street WWTF**

Constituent	Maximum Concentrations		
	30-day Average	7-day Average	Daily Maximum
BOD <sub>5</sub> , mg/L (lb/day)	30 (7,506)	45 (11,259)	N/A
TSS, mg/L (lb/day)	30 (7,506)	45 (11,259)	N/A
Fecal Coliform, number/100 mL	200	400	N/A
Cadmium, mg/L (lb/day)	0.004 (1.0)	0.004 (1.0)	0.004 (1.0)
Flow, mgd	30	N/A	N/A
Cyanide, mg/L (lb/day)	N/A	N/A	N/A
Oil and Grease, mg/L (lb/day)	10.0 (2,502)	20 (5,004)	N/A

Notes:

1. pH - standard units shall remain between 6.5 and 9.0.
2. Biomonitoring shall indicate an organism mortality less than 10 percent.
3. Loadings based on a 30-mgd flow.
4. mL – milliliters.

**Table 6-2. NPDES Permit Monitoring Requirements - Theresa Street WWTF**

<b>Constituent</b>	<b>Sampling Frequency</b>	<b>Influent Sample Type</b>	<b>Sludge Sample Type</b>
Cyanide, total	Daily	Grab	Grab
Oil and Grease	Weekly, quarterly	Grab	--
Cadmium, total	Daily, quarterly	24-hour composite	Grab
Chromium, total	Quarterly	24-hour composite	Grab
Copper	Quarterly	24-hour composite	Grab
Lead	Quarterly	24-hour composite	Grab
Nickel	Quarterly	24-hour composite	Grab
Nitrogen, total	Quarterly	24-hour composite	Grab
Zinc	Quarterly	24-hour composite	Grab
BOD <sub>5</sub>	Daily, annually	24-hour composite	--
TSS	Daily, annually	24-hour composite	--
pH - standard units	Daily, annually	Grab	Grab
Flow	Continuous	Metered	Metered
Fecal Coliform	Daily	Grab	N/A
Bio-monitoring	Annually	24-hour composite	N/A

**Current Northeast WWTF NPDES Permit.** Treated wastewater discharged from the Northeast WWTF is regulated by NPDES permit No. NE0112488. This permit was issued on December 4, 1987 and expired December 4, 1992. The NDEQ has also issued numerous administrative extensions to this permit since 1992. Currently, all requirements listed in the December 4, 1987 permit apply. The Northeast WWTF permit regulates effluent concentration of various parameters and defines monitoring requirements. The Northeast WWTF NPDES permit requirements are summarized in Tables 6-3 and 6-4. The 1987 NPDES permit will remain effective through administrative extensions until a new NPDES permit is issued, which is expected to occur in 2003.

The current Northeast WWTF NPDES permit also regulates biosolids application at the City-owned land application site and sets forth surface water and groundwater monitoring requirements. A copy of the Northeast WWTF NPDES permit is included in Appendix E.

**Table 6-3. NPDES Permit Limitations - Northeast WWTF**

Constituent	Maximum Concentration	
	30-day Average	7-day Average
BOD <sub>5</sub> , mg/L (lb/day)	30 (2,001)	45 (3,002)
TSS, mg/L (lb/day)	30 (2,001)	45 (3,002)
Fecal Coliform, number/100 mL	200	400
Flow, mgd	8.0	N/A
Ammonia, mg/L (lb/day)	N/A	N/A
Oil and Grease, mg/L (lb/day)	N/A	10 (667)

Notes:

1. pH - standard units shall remain between 6.0 and 9.0.
2. Biomonitoring shall indicate an organism mortality less than 10 percent.
3. Loadings based on an 8 mgd flow.
4. mL - milliliters.

**Table 6-4. NPDES Permit Monitoring Requirements - Northeast WWTF**

Constituent	Sampling Frequency	Influent Sample Type
Oil and Grease	Daily	Grab
Ammonia, total as N	Daily, quarterly	24-hour composite
BOD <sub>5</sub>	Daily, annually	24-hour composite
TSS	Daily, annually	24-hour composite
pH - standard units	Daily, annually	Grab
Flow	Continuous	Metered
Fecal Coliform	Daily	Grab
Total Residual Chlorine	Daily	Grab

**Potential Future NPDES Permits.** Since 1992 the City of Lincoln and NDEQ have been discussing new NPDES permits for both of the City's wastewater treatment facilities. It is anticipated that new NPDES permits will be issued in 2003 and that they will contain the same pollutant limits as the current permits plus new limits for constituents such as ammonia, residual chlorine, whole effluent toxicity, and possibly some metals. Of the possible new constituents to be regulated under the next NPDES permit, ammonia effluent limits could have the greatest impact to the Theresa Street and Northeast WWTFs with respect to required treatment upgrades. Potential ammonia effluent limits are discussed in more detail below.

**Potential Ammonia Effluent Limits.** In 1994 the City selected a technical consulting team to support efforts in determining appropriate chronic ammonia criteria applicable to Salt Creek Segment LP2-20000 and associated ammonia effluent limits for both the Theresa Street and Northeast WWTFs. Extensive chemical, biological, toxicity, and physical analysis of Salt Creek were initiated in 1994 under the Salt Creek Water Quality Studies (SCWQS) project. The intention of the SCWQS was to collect data for the development of site-specific seasonal chronic

ammonia criteria, which reflect some of the unique characteristics of Salt Creek and are protective of the biological community it supports. The City completed the final monitoring and data evaluation efforts in 2000 and the results are documented in various reports. The SCWQS-proposed chronic ammonia criteria and effluent limits are documented in the report titled *City of Lincoln, Nebraska Salt Creek Water Quality Studies, Site-Specific Chronic Ammonia Criteria Final Technical Report, June 16, 2000*.

As indicated in the Site-Specific Chronic Ammonia Criteria Final Technical Report (Table 5-2, Manuscript 5), seasonal chronic ammonia criteria were recommended based on bioassessment results, *in situ* study results, and an equal weighted combination of both.

As part of the SCWQS, a peer review team was organized through the Water Environment Research Foundation (WERF). The WERF Peer Review Team provided technical oversight and review of final results and recommendations for chronic ammonia criteria. The Peer Review Team also provided a final report to the City documenting their support in the City's efforts in developing chronic ammonia criteria. While the Peer Review Team's final report was supportive of the individual criteria and equal weighting of the bio-assessment-based criteria and the *in situ* criteria, the Peer Review Team could not support the use of the summer bio-assessment based criteria being used as a summer "floor" value. During discussions and negotiations with NDEQ, it was agreed by the City to base the site-specific chronic criteria on the *in situ* results only. The final site-specific criteria were approved by the Nebraska Environmental Quality Council in October 2002. The site-specific criteria were applied as three-season criteria (spring, summer, and winter) based on NDEQ-approved seasonal pH and temperature values.

Based on the chronic ammonia criteria developed through the SCWQS, chronic ammonia effluent limits were calculated for both the Theresa Street and Northeast WWTFs. Since final approval of the proposed criteria has not been provided by NDEQ, final limits may vary from the potential limits identified. The potential chronic ammonia effluent limits are presented in Table 6-5.

**Table 6-5. Anticipated Effluent Ammonia Limits\***  
(Calculated with 30-day Averaging Period for  
Waste Load Allocation Long-Term Average Multiplier)

Treatment Facility	Spring		Summer		Winter	
	Monthly Avg	Daily Max	Monthly Avg	Daily Max	Monthly Avg	Daily Max
	mg/L - N	mg/L - N	mg/L - N	mg/L - N	mg/L - N	mg/L - N
Theresa Street						
2008	8.29	21.71	2.88	7.55	8.34	21.84
2013	8.20	21.46	2.75	7.21	8.27	21.64
2025	8.05	21.07	2.55	6.68	8.15	21.31
2050	6.93	18.14	2.23	5.84	7.96	20.85
Northeast						
2008	13.99	36.62	5.68	14.86	14.87	38.93
2013	13.50	35.53	4.98	13.03	14.35	37.56
2025	12.45	32.58	4.18	10.94	13.81	36.16
2050	7.45	19.51	2.48	6.49	8.21	21.50

\* The effluent ammonia limits shown are not final and are based on the best information available at the time this report was prepared (March 2003).

It should be noted that the City and its technical team are still negotiating the final chronic ammonia criteria applicable to Segment LP2-20000 of Salt Creek and the resultant final chronic ammonia effluent limits. It is anticipated that the final chronic ammonia criteria and effluent limits will be established in 2003.

### **Current Wastewater Residuals Disposal Regulations**

Understanding and application of regulations relating to wastewater sludge utilization and disposal is necessary for evaluating existing sludge management practices, and for planning and evaluating future sludge treatment, utilization, and disposal alternatives. All relevant laws and regulations impacting current and potential future use and disposal, and critical elements of the laws and regulations which may constrain future sludge use and disposal should be considered.

Sludge use and disposal is controlled or affected by the following laws and regulations. While some are not directly applicable to wastewater sludge, they may impact the City's current and future sludge management program.

1. Standards for the Use and Disposal of Sewage Sludge, 40 CFR Part 503.
2. NDEQ proposed sludge regulations.
3. The Federal Clean Water Act. (CWA).
4. Resource Conservation and Recovery Act (RCRA) Subtitle D Municipal Solid Waste Regulations, 40 CFR Part 258.
5. RCRA Hazardous Waste Regulations, 40 CFR Part 261.
6. Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or Superfund requirements.
7. City of Lincoln and Lancaster County requirements and regulations.

Residuals are generated from several different treatment processes at the Lincoln Wastewater Treatment Facilities. These include:

- Influent Screening
- Grit Removal
- Primary Clarification
- Secondary Treatment

**Screenings and Grit.** The residuals generated from the screening and grit removal processes are hauled to the Lancaster County landfill for disposal. The regulation governing this practice is the Federal Resource Conservation and Recovery Act (40 CFR 258 or RCRA). The section of this regulation that applies to wastewater screenings and grit disposal is typically referred to as “Subtitle D”. The requirements of the Subtitle D regulation are basically that the material not be “hazardous” and that it not contain free water. Wastes are considered hazardous if they exhibit corrosivity, toxicity, reactivity, or ignitability. Wastes are considered to contain no free water if they pass the “Paint Filter Test”.

Generally, screenings and grit generated in domestic wastewater treatment facilities comply with the non-hazardous requirements, but treatment is generally required to eliminate free water. At both the Theresa Street and Northeast WWTFs, screenings and grit are de-watered sufficiently to meet the RCRA requirements.

**Primary and Secondary Sludges.** The primary federal regulations governing disposal of sewage sludge are regulations adopted by the US EPA under the Clean Water Act. These regulations were published as 40 CFR Part 503, and are commonly referred to as the "503 Regulations". The 503 Regulations govern the disposal of sewage sludge, or biosolids, by land application, surface disposal, and incineration. Land application refers to disposal of biosolids on land for beneficial use at agronomic rates. Agronomic rates means rates intended to supply the nitrogen requirements of the crops being grown, but rates that will not result in migration of nitrogen below the root zone. Surface disposal describes disposal on land at sites and rates not limited by the agronomic requirements of crops. This includes disposal practices such as sludge only landfills, sludge lagoons, and dedicated land disposal sites. The incineration practices covered by the 503 Regulations apply only to "sludge only" incinerators.

The 503 Regulations establish different site management and application practices for different qualities of biosolids. Biosolids quality is determined primarily on the basis of certain metal concentrations, the degree of treatment the biosolids receive prior to disposal, and the concentration of certain microorganisms in the biosolids at the time of disposal. The higher the quality level, the fewer the restrictions placed on disposal.

The 503 requirements that affect the City of Lincoln relate to biosolids disposal. A summary of the 503 Regulation requirements for biosolids applied to agricultural land is provided in Table 6-6.



**Table 6-6. Summary of 503 Regulations Applicable to Land Application of Biosolids**

<b>Disposal Method</b>	<b>Metals Requirements</b>	<b>Pathogen Reduction Requirement</b>	<b>Vector Attraction Reduction Requirement</b>	<b>Restrictions</b>
Sold or Given Away	Pollutant Limits for "High Quality" Sludge	Class A	Sludge Processing	These are "Exceptional Quality Biosolids" and no restrictions apply.
Applied in Bulk to Public Access Areas such as Parks or Golf Courses	Pollutant Ceiling Limits	Class A	Sludge Processing	Must comply with annual biosolids application limits and management practice requirements.
Applied to Agricultural Lands such as Crop Lands or Pasture Lands or Non-agricultural Lands such as Forests	Pollutant Ceiling Limits	Class B	Sludge Processing or Physical Barriers	Must comply with annual biosolids application limits and management practice requirements.

Biosolids are classified as either Class A or Class B under the 503 Regulations, depending on the quality of the biosolids and the type of treatment they have received prior to land application. The quality requirements associated with Class A and Class B biosolids are summarized in Tables 6-7 and 6-8.

**Table 6-7. Summary of Class A Biosolids Criteria**

<b>Class A biosolids must comply with both requirements 1 and 2 below:</b>	
Requirement 1 – Biosolids must meet one of the following criteria:	
Criteria 1A	Fecal Coliform Bacteria density less than 1,000 Most Probable Number (MPN) per gram of total dry solids (<1,000 MPN / gTs)
Criteria 1B	Salmonella density less than 3 MPN per 4 grams of total dry solids (<3 MPN/4gTs).
Requirement 2 – Biosolids must meet one of the following criteria	
Criteria 2A	Biosolids have been subjected to elevated temperatures according to requirements set forth in 503 Regulations.
Criteria 2B	Biosolids pH is raised to greater than 12 for at least 72 hours at temperatures specified in 503 Regulations and air dried to total solids by weight.
Criteria 2C	Biosolids complies with density requirements for Enteric Viruses and Viable Helminth Ova as stipulated in the 503 Regulations.
Criteria 2D	The biosolids have been treated by a “Process to Further Reduce Pathogens” (PFRP) or a PFRP equivalent process as defined by the 503 Regulations. PFRPs include: <ul style="list-style-type: none"><li>■ Composting (55°C)</li><li>■ Heat Drying</li><li>■ Heat Treatment</li><li>■ Thermophilic Aerobic Digestion</li><li>■ Beta Ray Irradiation</li><li>■ Gamma Ray Irradiation</li><li>■ Pasteurization</li></ul>

**Table 6-8. Summary of Class B Biosolids Criteria**

<b>Class B biosolids must meet one of the following pathogen requirements:</b>	
Requirement 1	Fecal Coliform Bacteria densities less than 2,000,000 MPN or Colony Forming Units (CFU) per gram of total dry solids (< 2,000,000 MPN or CFU/gTs).
Requirement 2	The Biosolids have been treated by a “Process to Significantly Reduce Pathogens” (PSRP) or a PSRP equivalent process as defined by the 503 Regulations. PSRPs include: <ul style="list-style-type: none"><li>■ Aerobic Digestion</li><li>■ Air Drying</li><li>■ Anaerobic Digestion</li><li>■ Composting (40°C)</li><li>■ Lime Stabilization</li></ul>

Biosolids generated in the primary and secondary treatment processes at the Lincoln WWTFs are applied to agricultural lands in the Lincoln area. At a minimum they must meet the pollutant ceiling limits for metals, the Class B requirements for pathogen reduction, and the vector attraction reduction requirements either by processing or with appropriate physical barriers at the application sites. Biosolids from both facilities are treated with anaerobic digestion to meet both the pathogen reduction and vector attraction reduction requirements.

Monitoring requirements associated with the 503 Regulations vary depending on the quantity of sludge or biosolids produced. Monitoring generally ranges from monthly to annually.

**Reporting Requirements.** Reporting and record keeping requirements also vary with the quality of the sludge produced. The two examples described below illustrate the range of the requirements:

1. If the sludge meets the alternate pollutant levels, Class A pathogen levels, and vector attraction reduction requirements, then the sludge is classified "exceptional quality" and the record keeping requirements are:
  - a. Pollutant concentrations,
  - b. Description of how Class A requirements are met,
  - c. Description of how vector attraction reduction requirements are met, and
  - d. Certification statement that requirements are met as determined under the treatment facility supervisor's direction.
2. If the sludge meets the pollutant ceiling limits, Class B pathogen reduction, and vector attraction reduction requirements, then the record keeping requirements are:
  - a. Location and size of application site,
  - b. Date and time sludge is applied,
  - c. Amount of each pollutant applied to each site,
  - d. Amount of sludge applied to each site,
  - e. Pollutant concentrations,
  - f. Description of how pathogen reduction is met,
  - g. Description of how vector attraction reduction is met,
  - h. Description of how site restrictions for Class B sludge are met,
  - i. Description of how management practices are met, and
  - j. Certification statement that requirements are met as determined under the treatment facility supervisor's direction.

Given the current treatment levels and sludge quality at Lincoln's facilities, the more stringent record keeping and reporting requirements apply.

The 40 CFR Part 503 Regulations require sludge permits for all wastewater facilities generating sludge. The sludge permit requirements may be covered in a facility's NPDES permit. The permit application must be submitted six months before the expiration of the existing NPDES permits for the treatment facility. States may require a sludge permit application before NPDES permits expire.

The information required for the permit application includes:

1. Sludge monitoring data and annual volumes;
2. Available groundwater monitoring data for landfills or land application sites;
3. Description of sludge use or disposal practices including location of application or disposal sites, contractors who apply sludge, and distributors who market sludge; and
4. A land application plan for each site, including:
  - a. Geographical area covered by plan,
  - b. Site selection criteria,
  - c. How the site will be managed, and
  - d. Advance notice to permit authority, adjacent landowners and occupants, and the public (if required by the State).

**Clean Water Act.** The federal CWA establishes requirements for all discharges to surface waters through the NPDES permit process. The authority for 40 CFR Part 503 sludge regulations is also provided by the CWA.

All point source discharges are required to have an NPDES permit and to comply with the required effluent conditions established in the permit. Sludge management and disposal in compliance with 40 CFR Part 503 Regulations is typically part of the NPDES permit.

Industrial waste pretreatment requirements are also part of the CWA requirements. In establishing local limits for pretreatment, sludge use must be considered.

**RCRA Hazardous Waste Regulations, 40 CFR Part 261.** RCRA regulations define and control the handling of hazardous waste. Wastewater sludge is exempt from RCRA requirements unless it is determined to be a hazardous waste through testing of toxicity characteristics.

Hazardous waste is defined in 40 CFR Part 261 by the following criteria:

- Ignitability
- Reactivity
- Corrosivity (pH less than 2 or more than 12.5)
- Toxicity characteristics
- Listed hazardous waste

Toxicity characteristics are determined by analyzing the sludge for hazardous characteristic and contaminants using the Toxicity Characteristics Leaching Procedure (TCLP) test. Wastewater sludge usually does not exceed any of the maximum concentration levels but individual WWTF sludges should be analyzed to confirm this.

### **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).**

CERCLA may be applied to require corrective actions to remove hazardous substances discharged to the environment. This legislation establishes liability and corrective actions for parties responsible for the discharge. The liability is extensive and comprehensive. Although remote, the application of CERCLA liability to wastewater sludge may be possible if hazardous substances are traced to the sludge. Further, if a landfill has been determined to be a hazardous waste source, liability can be attached to wastewater sludge that was disposed in it.

Failure to fully acknowledge all hazardous substances in wastewater sludge may incur CERCLA liability, especially if any unpermitted constituents are later determined to pose a threat to human health or the environment. The best protection is to ensure that all hazardous substances in the sludge are identified during the US EPA permitting process.

### **Evolving Regulations and Standards**

From a planning perspective it is important to have knowledge of existing local, state, and federal regulations and requirements. It is also important to have a solid understanding of how these requirements may change or what new regulatory requirements are under development. Many new requirements or initiatives at the national level have evolved over the past few years and are making their way down to the state and local level. This section presents some of the current and future regulatory initiatives that could have an impact to the City of Lincoln.

**Clean Water Act Reauthorization.** Reauthorization of the Clean Water Act was expected to be completed in 1994. Congress did not act on reauthorization but is expected to do so in the future. Issues within the proposed reauthorized act included stormwater and other non-point discharges, sediment criteria, innovative approaches such as point/non-point source pollutant trading, and pollution prevention. An additional key element is encouragement for water quality agencies to develop and implement watershed management plans. There is also the potential for increased flexibility and funding for states in several programs, including the control of non-point source pollution.

**Clean Water Action Plan.** In 1997 the Clinton Administration directed US EPA and other agencies to develop a Clean Water Action Plan (CWAP) that defines a course toward fulfilling the original goal of the Clean Water Act. The CWAP also addresses drinking water safety, including both chemical and microbiological contamination potential. In 1998 the CWAP was finalized; its focus is on a cooperative approach to watershed protection among state, tribal, federal and local governments and the public. The first step is to identify those watersheds with the most critical water quality problems and work together to focus resources and implement effective strategies to solve these problems. The CWAP has three major goals:

- Enhance protection from public health threats posed by water pollution,
- More effectively control polluted runoff (non-point source), and
- Promote water quality protection on a watershed basis.

A watershed focus helps identify the most cost-effective pollution control strategies to meet clean water goals. Key elements of a watershed approach include:

- Unified watershed assessments,
- Watershed restoration action strategies,
- Watershed pollution prevention, and
- Watershed assistance grants.

Although the CWAP puts more focus on non-point source contributions to water pollution, point source dischargers likely will play a part in meeting the goals of the CWAP. Opportunities exist to include more input from non-point source contributors, and the CWAP emphasizes the importance of their involvement. Funding has been earmarked for this effort through the Clean Water and Watershed Restoration Budget Initiative.

**National Criteria Revisions – Water Quality Criteria and Standards Plan.** The US EPA Office of Science and Technology in the Office of Water developed the *Water Quality Criteria and Standards Plan – Priorities for the Future* to identify and communicate key scientific and technical priorities the agency plans to pursue, together with the states and tribes, to enhance and improve water quality criteria and standards programs across the country. This plan was developed to support the CWAP announced by President Clinton in February 1998.

The Water Quality Criteria and Standards Plan presents a “vision” and strategy for important new initiatives and improvements that could be made to the water quality criteria and standards program to better protect human health and maintain or enhance the quality of the nation’s water bodies.

The seven new criteria and standards program initiatives that the US EPA is expected to take over the next decade include:

1. Maintaining and strengthening the existing ambient water quality criteria for water and sediments.
2. Developing nutrient criteria and assessment methods to better protect aquatic life and human health.
3. Developing criteria for microbial pathogens to better protect human health during water recreation.
4. Completing the development of biocriteria as an improved basis for aquatic life protection.
5. Developing improved methods for developing TMDLs and modeling to better translate water quality standards into implementable control strategies.
6. Evaluating possible criteria initiatives for sedimentation, flow, and wildlife.
7. Ensuring implementation of these new initiatives and improvements by the US EPA in partnership with the states and tribes.

The Water Quality Criteria and Standards Plan “Vision” states that:

*“The water quality criteria and standards program will fully integrate biocriteria, nutrient criteria, and microbial pathogen control with improved chemical-specific criteria, whole effluent toxicity methods, and possible sedimentation, flow and wildlife criteria, into criteria and standards programs to better support watershed management for the protection of human health and the maintenance and improvement of the chemical, physical, and biological integrity of the Nation’s waters. Future criteria initiatives for excessive sedimentation, flow and wildlife will be investigated.”*

While this Plan strives to improve water quality, it does not replace the CWA or US EPA’s regulations, nor is it a regulation itself.

**TMDL Regulation.** Under Section 303(d) of the 1972 Clean Water Act, states are required to develop lists of impaired and threatened waters that do not meet the state’s water quality standards and update these lists every two years. This law also requires that the states establish priority rankings for the waters on the list and develop TMDLs for these waters. This is a process that the NDEQ implements and that may affect the acceptability of permitting new discharges or expansions at existing wastewater treatment facilities.

A TMDL identifies the maximum amount of pollutant that a water body can receive and still meet water quality standards. It then allocates this pollutant loading among point and non-point pollutant sources that affect the water body. Waste load allocations for point dischargers are established through the discharger’s NPDES permit. The plan for implementing load allocations for waters with primarily non-point sources of pollution will include incentive-based, non-regulatory or regulatory measures, a public participation process, and recognition of watershed management processes and programs. A TMDL must also include a margin of safety and consideration of seasonal variations.

US EPA guidance suggests that TMDLs be developed expeditiously, or within 8 to 13 years after the original listing of the water body. By law, the US EPA must approve both the list and TMDL, or establish it based on federal guidelines. Although part of the original CWA, states and the US EPA did not initially fulfill their responsibility to develop Section 303(d) lists and TMDLs until citizen organizations began bringing legal actions against the US EPA. The US EPA is now under court order or consent decrees in many states to ensure that TMDLs are established, either by the state or by the US EPA.

In 1996 the US EPA began a comprehensive evaluation of Section CWA 303(d) implementation. The US EPA convened a Federal Advisory Committee, whose recommendations served to guide the development of proposed changes to the TMDL regulations issued by the US EPA. These changes were issued in draft form in August 1999. Following a comment period, the US EPA published the Final Rule in July 2000. Even though a Final Rule was promulgated, a congressional “rider” prohibited the US EPA from spending FY2000 or FY2001 money to implement the new rule. As a result, states are continuing to operate under the 1992 TMDL regulations.

In July 2001 the National Research Council (NRC) presented their review of the July 2000 TMDL Final Rule, which is documented in the report titled “*Assessing the TMDL Approach to Water Quality Management.*” In its review, the NRC recommended changes to the TMDL process, including:

1. Changes to the process of assessing water bodies for impairment and Section 303(d) listing,
2. Evaluation of the scientific basis for TMDL development, and
3. Implementation of the TMDL with emphasis on adaptive implementation, which is a more cost effective and streamline process.

In late July 2001 the US EPA placed an eighteen-month moratorium on the July 2000 TMDL Final Rule to allow time for additional review and possible revamping of the rule. With the moratorium, state agencies are expected to revert back to the initial TMDL rule. However, the moratorium is not likely to slow down the TMDL process and schedule that the NDEQ has set in place.

**Nutrient Criteria.** In 1999 the US EPA published two technical guidance manuals for the development of nutrient criteria for rivers and streams and for lakes and reservoirs. The purpose of the manuals was to provide scientifically defensible technical guidance to assist states and tribes in developing regionally based numeric criteria and algal criteria for river, stream, lake, and reservoir systems. The CWAP focuses attention on addressing nutrient enrichment problems. Some of the primary goals set in the US EPA guidance manuals include:

1. Identification of water quality needs and goals.
2. Selection of appropriate variables and development of a monitoring program.
3. Collection and analysis of data.
4. Development of criteria and implement nutrient controls.
5. Monitoring effectiveness of controls and reassessing validity of criteria.

The US EPA proposed various options to develop nutrient criteria. One option involved the use of percentile values based on actual data from groups of water bodies, including reference waters (minimal or no impact), or using a group of waters that would include some that are impaired. The US EPA also proposed a second method that advocated the refinement of trophic classification systems, use of models, and examination of system biological attributes to assess nutrient and algal variables. A third method provided several published nutrient/algal thresholds that may be used or modified as criteria.

In 2000 and early 2001 the US EPA developed and published recommended nutrient criteria for fourteen Ecoregions within the United States. These numeric criteria are based on the approach of using percentile values based on actual data from groups of water bodies within each Ecoregion. Most of the waters in the Lincoln area fall within Ecoregion VI – Corn Belt and Northern Great Plains. The Ecoregion VI criteria will apply unless the NDEQ adopts state specific criteria or some other accepted alternative for nutrient control. The US EPA’s proposed criteria for Ecoregion VI are shown in Table 6-9.

**Table 6-9. US EPA Proposed Nutrient Criteria for Ecoregion VI**

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<b>Nutrient</b>	<b>EPA Recommended Criteria for Streams and Rivers</b>	<b>EPA Recommended Criteria for Lakes and Reservoirs</b>
Total Phosphorus (TP), ug/l	76.25	37.5
Total Nitrogen (TN), mg/L	2.18	1.68
Chlorophyll-a, ug/l	7.33	8.59
Turbidity, NTU	9.89	N/A
Secchi Depth, m	N/A	1.36

**Bacteria Standards.** Current Nebraska water quality criteria for recreational uses are based on fecal coliforms. The US EPA has been evaluating the appropriateness of fecal coliforms as the bacteriological indicator of pathogens in surface waters. In the *1986 Ambient Water Quality Criteria for Bacteria*, the US EPA recommended criteria for *E. coli* (126/100 mL) and *Enterococci* (33/100 mL) for recreational waters because these organisms have a higher correlation with certain human disease outbreaks than fecal coliforms. Indicator organisms are currently used as criteria because direct analyses for pathogens are difficult and costly. In current permit renewals many states are initiating requirements for *E. coli* monitoring and comparisons between fecal coliform and *E. coli* to help develop a correlation between the two. In the near future, states are expected to require *E. coli* effluent limitations in place of fecal coliforms. However, fecal coliforms may continue to be a monitoring requirement since the *E. coli* test is more difficult and, to date, not as reliable (greater variability) as the fecal coliform tests.

**Whole Effluent Toxicity.** Since the US EPA's ruling adding whole effluent toxicity (WET) to 40 CFR Part 136, WET testing has come under much scrutiny for the uncertainty and variability in WET testing procedures and results. The primary concerns are that the US EPA is inconsistent in their methodology for WET testing requirements and the analysis of WET testing results. The probability of false positive results and inter-laboratory and intra-laboratory variability are also issues of concern. Litigation resulting from the US EPA's 1995 ruling yielded a settlement agreement committing the US EPA to undertake several actions. Among these actions are:

1. Conducting a comprehensive inter-laboratory validation study on all of its WET testing methods,
2. Issuing a number of rulemakings, and
3. Publishing several guidance documents.

When this work has been completed, the final revised policy will be published in the Federal Register, thus promulgating a new rule. The new rule will affect current state requirements for WET testing and application of WET effluent limitations.

**Sanitary Sewer Overflows (SSO).** SSO regulations are expected to be promulgated by the US EPA in the near future. These regulations are expected to prohibit sanitary sewer overflows and establish specific management, operation, and maintenance requirements for wastewater collection system operators. The most significant aspect of the SSO regulations, as they apply to Lincoln, is the prohibition of sanitary sewer overflows or treatment system bypasses during wet weather conditions.

**Sediment Criteria.** The US EPA is currently in the process of developing sediment quality criteria. The rationale for sediment quality criteria is that sediments act as sinks for many pollutants and often become a source of contaminants both to benthic organisms and to water column species. The criteria will be an additional tool to help accomplish a wide range of environmental goals including pollution prevention, contaminated sediment assessment, remediation evaluations, and ecological risk assessment. The final publication of the sediment quality criteria will provide national guidance to state water quality programs, US EPA programs, and other agencies. The final criteria may be incorporated, in some manner, into effluent discharge limitations.

**Stormwater Discharge Regulation.** In 1993 Lincoln submitted a Municipal - Part 2 NPDES Permit Application for a stormwater discharge permit. The NPDES Part 2 Permit Application is part of the federally mandated NPDES regulations promulgated on November 16, 1990 (55 CFR 47990). Origination of this legislation began with the Clean Water Act, which under 1987 amendments required the US EPA to establish requirements for stormwater discharges. The US EPA has authorized the NDEQ to administer NPDES applications for stormwater discharges for the State of Nebraska.

The National Urban Runoff Program has shown that stormwater from residential and commercial areas, along with industrial areas, can contain a variety of pollutants. Additional areas of concern include the potential for illicit discharges of untreated non-stormwater discharges, spills, and improperly disposed wastes. It has been determined in recent years that such stormwater discharges to receiving waters have been detrimental to receiving water quality.

Requirements of the NPDES stormwater permit include implementation of best management practices, monitoring, compliance with discharge limits for specific parameters, and investigation of illicit discharges under a stormwater management program.

**Clean Air Act Amendments (CAAA).** According to US EPA estimates, publicly owned treatment works (POTWs) emit approximately 11,000 tons of toxic air pollutants annually. Although this quantity amounts to less than 0.1 percent of all toxic air emissions in the U.S., the lack of progress in achieving National Ambient Air Quality Standards (NAAQS) in many urban areas has resulted in air quality regulations becoming significantly more stringent. Federal and state regulators are taking a closer look at air emissions from wastewater treatment facilities. Today, regulators are concerned with everything from fugitive odors and volatile organic compounds (VOCs) from treatment processes to emissions of toxic air contaminants (TACs) from digester gas combustion. To reduce emissions of TACs and VOCs, the 1990 CAAA require that emission controls be installed at larger existing wastewater treatment facilities. Additionally, the CAAA require that emissions from existing combustion equipment such as boilers and flares be controlled.

Title III of the CAAA requires that major sources of 189 listed hazardous air pollutants (HAPs) install maximum achievable control technology (MACT) to reduce HAP emissions. A “major” source is defined as a facility that has the potential to emit 10 tons per year of a single HAP, or 25 tons per year of combined HAPs. For existing facilities, MACT will be based on the average emissions limit achieved by the best performing 12 percent of existing sources across the country.

The US EPA has promulgated specific standards which identify MACT for 174 source categories. Furthermore, the US EPA has required each state to promulgate its own air quality permitting requirements. The NDEQ Air Quality Division has passed this responsibility on to the Lincoln/Lancaster County Health Department. Under these requirements the City must obtain a Class 1 operating permit at the Theresa Street facility and a Class 2 operating permit at the Northeast facility.

Class 1 operating permits are required for emissions of criteria pollutants of 100 tons per year (tpy) or more. Class 2 operating permits are required for emissions of 40 tpy or more. Criteria pollutants include:

- Carbon monoxide,
- Nitrogen oxides,
- Sulfur dioxide,
- Particulate matter - 10 microns (PM-10),
- Total suspended particulates,
- Ozone, and
- VOCs.

Incorporation of the current and anticipated regulatory requirements presented here is fundamental to development of an effective wastewater facilities plan for the City of Lincoln.